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EXAMINER	
HUNG, YUBIN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/040,621	LIM ET AL.
	Examiner	Art Unit
	Yubin Hung	2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12,14-19,23-25,29-31 is/are rejected.

7)☒ Claim(s) 13,20-22,26-28,32 and 33 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 January 2002 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 09/29/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because a descriptive title and labels for the two axes for Figure 5are missing. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Image retrieval Method Based on Combination of Color and **Texture** features".

3. The disclosure is objected to because of the following informalities:

- P. 7, line 8; P. 18, Eq. (8); claim 17, line 4: $\sigma(m_{ij})$ and $\sigma(\sigma_{ij})$ are not defined
- P. 8, line 1; P. 20, line 1; claim19, line 11: need to specify that [n/l] and [m/l] are the results of applying the ceiling function (i.e., rounding up) since "[ ]" is not the standard notation for the ceiling function.
- P. 11, line 6; P. 24, line 16; claim 33, last line: the ω with a tilde ("~") over it is not defined. Consider change all instances to ω without the tilde **(Note: for examination purpose, ω_c and ω_t will be assumed.**
- P. 23, Eq. (15) and claim 31, line 4: the $V_{m,k}$ on the right-hand side of the equation should have been "V_k"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11, 13, 17, 26, 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 11 recites the limitation "N" in line 5. There is insufficient antecedent basis for this limitation in the claim. Claim 13 inherits this problem through dependency. **(Note: for examination purpose, "N" will be interpreted to mean "N_k.")**

7. Claim 17 recites the limitation " $\sigma(m_{ij})$ and $\sigma(\sigma_{ij})$ " in line 4. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 26 recites the limitation " $d_t(I_q,I_1)$" in line 2. There is insufficient antecedent basis for this limitation in the claim. Specifically, the function $d_t(I_q,I_1)$ has not been defined. **(Note: for examination purpose, "$d_t(I_q,I_1)$" will be interpreted to have been defined as per Eq. (8) on P. 18 of the specification.)**

9. Claim 33 recites an equation with the following terms: I_q, I_1, $d'_c(I_q,I_1)$, $d'_t(I_q,I_1)$; ω_c and ω_t (both with a tilde). There is insufficient antecedent basis for this limitation in the claim. **(Note: for examination purpose, they will be interpreted as per the definitions in the specification such as Eq. (18) on P. 24.)**

Claim Rejections - 35 USC § 102

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Murakawa (US 6,463,432).

11. Regarding claim 1, Murakawa discloses a method for retrieving a data image similar to a query image

- using a feature distance calculated by combining one or more color distances and one or more texture distances by considering human visual perception attributes
  [Fig. 7; Fig. 8, refs. V141-V143; Col. 7, line 17 - Col. 8, line 67. Note that per the equation at the bottom of Col. 8, the total similarity is a weighted sum of the color distance and the texture distance and there is compatible with human perception because more weight is given to the more dominant feature]

12. Regarding claim 2, Murakawa discloses a method for retrieving a data image similar to a query image

(a) calculating a plurality of color distances and a plurality of texture distances between a query image and each data image in the image database
[Fig. 3: S13, S14; Fig.7: S1407; Fig. 8: V142; Col. 8, lines 27-45. Note that the distances are calculated for the key image and each of the object images for the color and the texture features]
(b) weighting each of the calculated color distances and texture distances with a respective predetermined weighting factor
[Fig. 7: S1408; Fig. 8: V141 (calculate predetermined weighting factors), V143 (weight the color and the texture distances and combine them); Col. 8, lines 46-67]
(c) calculating a feature distance between the query image and each data image by combining the weighted color distances and the

weighted texture distances by considering human visual perception attributes
[Fig. 7; Fig. 8, refs. V141-V143; Col. 7, line 17 – Col. 8, line 67. Note that per the equation at the bottom of Col. 8, the total similarity is a weighted sum of the color distance and the texture distance and there is compatible with human perception because more weight is given to the more dominant feature]

(d) determining the data image similar to the query image using the feature distance
[Fig. 7: S1409, S1410; Fig. 8: V144; Col. 9, lines 1-25]

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 3, 4, 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), as applied to claims 1, 2 above, and further in view of Tanaka (US 6,519,360) and Murching et al. (US 6,693,962).

15. Regarding claim 3, Murakawa discloses all limitations of its parent, claim 2.

Murakawa does not expressly disclose

(pa-1) segmenting the query image and each data image into a plurality of first regions using a plurality of color features

(pa-2) determining a plurality of sample regions in the query image and each data image for extraction of a plurality of texture features

However, Tanaka teaches/suggests segmenting an image into multiple regions using color groups (as color features). [See Fig. 1: 103; Col. 3, lines 56-63. Note that each color group defines a region of pixels. Note further that Fig. 1 clearly shows that both the query image and data images are segmented in this manner.] In addition, Murching teaches/suggests dividing an image into non-overlapping rectangular blocks and then merge them into spatially contiguous groups of blocks (i.e., sample region) homogeneous in texture. [See Fig. 1 and Col. 2, lines 13-20.]

Murakawa, Tanaka and Murching are combinable because they all have aspects that are from the same endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary to modify the invention of Murakawa with the teaching of Tanaka and Murching by segmenting an image into multiple regions using color groups and dividing an image into spatially contiguous groups of blocks (i.e., sample region) homogeneous in texture. The motivation would have been by so doing feature extraction from the regions can be carried in parallel and therefore increase the processing speed.

Therefore, it would have been obvious to combine Tanaka and Murching with Murakawa to obtain the invention of claim 3.

16. Regarding claim 4, the combined invention of Murakawa, Tanaka and Murching further discloses

(a1) generating a plurality of color vectors of the first regions using the color features and calculating a plurality of color distances
[Tanaka: Col. 3, lines 60-63 (color vector); Fig. 1, ref. 105 and Fig.6, ref. S4 (calculating color distances). Note that a representative color, consisting of several elements, is considered as a color vector]

(a2) generating a plurality of texture vectors of the sample regions using the texture features and calculating a plurality of texture distances
[Murching: Col. 5, lines 11-14. Note that per the analysis of claim 2 Murakawa teaches calculating texture distances]

17. Regarding claims 18, Murching further discloses

(pb-1) obtaining a grid map of the query image and each data image
[Col. 2, lines 13-15. Note that the blocks resulted from the division is considered a grid map.]

(pb-2) obtaining a texture sample of a desired size for each sample region based on the grid map
[Col. 2, lines 13-20. Note that each resultant region is consider a texture sample (since it's homogeneous in texture) and is of a desired size in the sense of achieving the homogeneity]

18. Regarding claim 23, Murakawa further discloses

- (b-1) placing each of the color distances and the texture distances in a 2-dimensional vector space, each vector space defined by the respective distances and associated predetermined weighting factors
[Fig. 8, refs. V141, V142. Note that a feature (color or texture) and its corresponding weight constitute a point in a 2-D vector space]
- (b-2) projecting the result of the placement onto the 2-dimensional vector spaces onto a 1-dimensional distance space based on the human visual perception mechanism
[Fig. 8, V143; Col. 8, lines 62-67. Note that per the equation at the bottom of Col. 8, the total similarity (a 1-dimension

distance) is a weighted sum of the color distance and the texture distance and there is compatible with human perception because more weight is given to the more dominant feature]

***

19. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18 and 23 above, and further in view of Deng et al. ("Peer Group Filtering and Perceptual Color Image Quantization," *Proc. 1999 IEEE International Symposium on Circuits and Systems, Vol. 4*, 30 May-2 June 1999, pp. 21-24, **referred to as Deng-PGF**).

20. Regarding claim 5, and similarly claim 6, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 3.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose that

- (claim 5) wherein step (pa-1) comprises quantizing a plurality of color vectors of the query image and each data image
- (Claim 6) performing a peer group filtering on the query image and each data image for noise removal and smoothing effects
- (claim 6) clustering a plurality of filtered pixel values of the query image and each data image using a generalized Lloyd algorithm

However, Deng-PGF teaches/suggests performing a peer group filtering on the images followed by an application of the generalized Lloyd algorithm for

clustering and vector quantization. [See P. 22, Sect. 3, line 17 through P. 23, left col., line 5.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Deng-PGF because they all have aspects that are from the same endeavor of image processing.

At the time of the invention, it would have been obvious to one of ordinary to modify the combined invention of Murakawa, Tanaka and Murching with the teaching of Deng-PGF by performing a peer group filtering on the images followed by an application of the generalized Lloyd algorithm for clustering and vector quantization. The motivation would have been because noise removal and smoothing are important to many image processing applications and the commonly used approaches have drawbacks such as their indiscriminate application to all pixels (including the non-corrupted ones) or blurring edges and other details-problems for which Deng's approach can address. (See Deng-PGF: P. 21, left Col., Introduction.)

Therefore, it would have been obvious to combine Deng-PGF with Murakawa, Tanaka and Murching to obtain the inventions of claims 5 and 6.

***

21. Claims 7-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360), Murching et al. (US 6,693,962) and Deng et al. ("Peer Group Filtering and Perceptual Color Image Quantization," *Proc. 1999 IEEE International Symposium on Circuits and Systems, Vol. 4*, 30 May-2 June 1999, pp. 21-24, referred to as Deng-PGF), as applied to claims 5, 6 above, and further in view of Deng et al. ("Color Image Segmentation," *1999 IEEE Conf. On Computer Vision and Pattern Recognition, Vol. 2*, 23-25 June 1999, pp. 446-451, **referred to as Deng-CIS**).

22. Regarding claim 7 the combined invention of Murakawa, Tanaka, Murching and Deng-PGF discloses all limitations of its parent, claim 5.

The combined invention of Murakawa, Tanaka, Murching and Deng-PGF does not expressly disclose that

- defining a J-value indicating a color uniformity in each pixel of a plurality of pixels of the query image and each data image, which have undergone quantization
- storing the J-value in each pixel of the query image and each data image to obtain a plurality of J-images
- segmenting each J-image into a plurality of second regions by a predetermined segmentation method
- repeating the segmentation of each J-image to obtain a map of one or more over-segmented regions for each J-image
- obtaining a final map for each J-image by merging the over-segmented regions based on a correlation of color

However, Deng-CIS teaches/suggests defining J-values, obtaining J-images, iteratively segmenting the obtained J-images and obtaining a final map for the J-

image by merging. [See P. 449, Fig. 5; P. 449, left col., line 1 – P. 450, left col., line 9.]

The combined invention of Murakawa, Tanaka, Murching and Deng-PGF are combinable with and DEG-CIS because they all have aspects that are from the same endeavor of image processing.

At the time of the invention, it would have been obvious to one of ordinary to modify the combined invention of Murakawa, Tanaka, Murching and Deng-PGF with the teaching of Deng-CIS by defining J-values, obtaining J-images, iteratively segmenting the obtained J-images and obtaining a final map for the J-image by merging. The motivation would have been because this approach is designed to handle segmentation difficulty that may occur due to the presence of color texture patterns. [See Deng-CIS: P. 446, Introduction.]

Therefore, it would have been obvious to combine Deng-CIS with Murakawa, Tanaka, Murching and Deng-PGF to obtain the invention of claim 7.

23. Regarding claim 8, Tanaka further discloses

- indexing a feature vector space by a representative color and a percentage of the representative color in each second region [Col. 3, lines 56-63. Note that the number of pixels represented by the representative color is equivalent to its percentage since the total number of pixels in the image is known]

24. Regarding claim 9, it is similarly analyzed and rejected as per the analyses of claims 6 and 7. [Specifically, Fig. 5 of Deng-CIS teaches/discloses both increasing and merging of segments (i.e., clusters).]

25. Regarding claim 12, Tanaka further discloses

- assigning a plurality of representative colors to a plurality of grid points in a color space having a grid structure; and storing the result of the assignment as a table in a database [Fig. 5A. Note that the table in Fig. 5A teaches/suggests a grid structure where the (representative color, percentage) index can be stored. Note further that it is obvious in a database application to store required information in the database]

***

26. Claims 10, 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18 and 23 above, and further in view of Cieplinski (US 6,801,657).

27. Regarding claims 10 and 11, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 4.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose

- (claim 10) the color features are expressed by a color feature descriptor $f_c(I_k)$ with a representative color vector and a percentage of the representative color vector for each first region
- (claim 11) the color feature descriptor $f_c(I_k)$ is expressed by:

$$f_c(I_k) = \{(C_{k1}, P_{k1}), (C_{k2}, P_{k2}), \ldots, (C_{kn}, P_{kn})\}$$

wherein k is a positive integer indicating a serial number of each region, C_{ki} is an i-th representative color vector of a k-th region (i = 1,2, .., N_k) , P_{ki} is a percentage of the i-th color representative color vector in the k-th region, and N_k is the number of the representative color vectors in the k-th region

However, Cieplinski teaches/suggests s representing each region with a descriptor composing of one or more representative colors and the percentages of pixels with the respective representative colors. [See Col. 2, line 56 – Col. 3, line 10.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Cieplinski because they all have aspects that are from the same endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary to modify the combined invention of Murakawa, Tanaka and Murching with the teaching of Cieplinski by representing each region with a descriptor composing of one or more representative colors and the percentages of pixels with the respective representative colors. The motivation would have been to overcome shortcomings of commonly used representations such as those based on histograms as Cieplinski indicated in Col. 1, line 63 – Col. 2, line 5.

Therefore, it would have been obvious to combine Cieplinski with Murakawa, Tanaka and Murching to obtain the inventions of claims 10 and 11.

28. Regarding claim 24, Cieplinski further discloses

- the predetermined weighting factor to the color distance is determined based on a distribution of representative colors [Col. 2, lines 63-67]

***

29. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18 and 23 above, and further in view of Ma et al. ("Texture Features and Learning Similarity," *Proc. 1996 IEEE Conf. on Computer Vision and Pattern Recognition*, 18-20 June 1996, pp. 425-430).

30. Regarding claims 14-16, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 4.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose

- (claim 14) step (a2) uses a Gabor function
- (claim 15) in step (a2), the texture vectors of the plurality of sample regions are generated using the Gabor function having N frequency channels and M orientation channels, where N and M are both predetermined positive integers
- (claim 16) (*for each region*) the texture features are expressed by a texture feature descriptor consisting of the set of (mean, deviation) pairs of a plurality of pixel values corresponding to the i-th frequency channel and the j-th orientation channel for all i and j values.

However, Ma teaches/suggests using multiple Gabor functions (with different frequency and orientation) to generate texture features and express them by the

recited texture feature descriptor. [P. 426, Sect. 2.1. Note that there are S (= 4) frequency channels and K (= 6) orientation channels.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Ma because they all have aspects that are from the same endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary to modify he combined invention of Murakawa, Tanaka and Murching with the teaching of Ma by using multiple Gabor functions (with different frequency and orientation) to generate texture features and express them by the recited texture feature descriptor. The motivation would have been because it is well known in the art that Gabor filters are considered as orientation and scale tunable and texture features extracted using Gabor filters have been empirically shown to perform better in image retrieval as indicated by Ma in P. 425, Sect. 2, lines 4-7 and P. 426, Sect. 2.3.

Therefore, it would have been obvious to combine Ma with Murakawa, Tanaka and Murching to obtain the inventions of claims 14-16.

31. Claim 17 is rejected because the similarity measure defined there is the well-known city-block distance (i.e., the L_1 metric) of the normalized feature descriptors of the regions being compared.

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32. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18 and 23 above, and further in view of Nakao et al. (US 5,999,647).

33. Regarding claim19, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 18.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose that for each region, its circumscribing rectangle is divided into sub-rectangles and each sub-rectangle is given a value of 1 if and only if it is completely inside the region.

However, Nakao teaches/suggests enclosing a region in a rectangle, dividing it into sub-rectangles and assigning each sub-rectangle a value of 1 if and only if it is completely inside the region. [Fig. 14. Note that the region is the pixels occupied by the letter "a" and each sub-rectangle has a size of 1x1.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Nakao because they all have aspects that are from the same endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary to modify he combined invention of Murakawa, Tanaka and Murching with the teaching of Nakao by enclosing a region in a rectangle, dividing it into sub-rectangles and assigning each sub-rectangle a value of 1 if and only if it is completely inside the region. The motivation would have been to limit subsequent operations to be applied to areas that are completely inside a region of interest so that the result won't be negatively affected by pixels not of interest.

Therefore, it would have been obvious to combine Nakao with Murakawa, Tanaka and Murching to obtain the invention of claim 19.

***

34. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18, 23 above, and further in view of Hargrave, III et al. (US 6,081,612).

35. Regarding claim 25, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 23.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose that the predetermined weighting factor to the color distance is determined by an entropy weighting factor.

However, Hargrave teaches/suggests using an entropy weighting factor. [Col. 8, lines 1-14. Note that while the entropy weighting factor recited in the claim and the one used in Hargrave differ in that the recited factor does not have the constant term of $\log_2 N$. However, it is a matter of design choice since applicant has not disclosed that not using the constant term provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with using the constant term because in either case the entropy weighting factor can consistently reflect the significance of the color distance.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Hargrave because they all have aspects that are from the same endeavor of file retrieval.

At the time of the invention, it would have been obvious to one of ordinary to modify he combined invention of Murakawa, Tanaka and Murching with the teaching of Hargrave by using an entropy weighting factor to the color distance. The motivation would have been because the entropy weight value serves to

indicate the relevance of the term the weight is applied to among a set of terms (to be combined with it) as Hargrave indicated in Col. 7, lines 56-58.

Therefore, it would have been obvious to combine Hargrave with Murakawa, Tanaka and Murching to obtain the invention of claim 25.

***

36. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakawa (US 6,463,432), Tanaka (US 6,519,360) and Murching et al. (US 6,693,962), as applied to claims 3, 4, 18, 23 above, and further in view of Prichep (US 5,083,571).

37. Regarding claims 29 and 30, the combined invention of Murakawa, Tanaka and Murching discloses all limitations of its parent, claim 23.

The combined invention of Murakawa, Tanaka and Murching does not expressly disclose that the color and the texture distances are subject to Gaussian normalization.

However, Prichep teaches/suggests applying Gaussian normalization to some computed quantities. [Fig. 1, ref. 28; Col. 7, lines 45-52.]

The combined invention of Murakawa, Tanaka and Murching are combinable with Prichep because they all have aspects that are from the same endeavor of feature extraction.

At the time of the invention, it would have been obvious to one of ordinary to modify he combined invention of Murakawa, Tanaka and Murching with the teaching of Prichep by applying Gaussian normalization to some computed quantities (e.g., distances). The motivation would have been to improve subsequent analysis, as Prichep indicated in Col. 7, lines 47-48.

Therefore, it would have been obvious to combine Prichep with Murakawa, Tanaka and Murching to obtain the inventions of claims 29-30.

38. Regarding claim 31, while Prichep discloses the application of a Gaussian normalization operation, it does not disclose expressly using a displacement of ($\mu - 6\sigma$) and a scaling factor of 6σ for the normalization. (This is easily obtained by combining the equations for $V_{m,k}$ and $V'_{m,k}$ recited in the claim.)

However, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a displacement of ($\mu - 6\sigma$) and a scaling factor of 6σ. Applicant has not disclosed that using a displacement of ($\mu - 6\sigma$) and a scaling factor of 6σ provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would

have expected Applicant's invention to perform equally well with either the spacing taught by Prichep or the claimed displacement of ($\mu - 6\sigma$) and scaling factor of 6σ because both can transform the computed quantities into the same scale (i.e., relative to their respective STD) and therefore can be properly combined or compared.

Allowable Subject Matter

39. Claims 20-22, 27-28 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

40. Claim13, 26 and 33 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

41. The following is a statement of reasons for the indication of allowable subject matter:

- Regarding claim 13, prior art of record does not teach or suggest the use of the recited distance metric.
- Regarding claim 20, and similarly it depend claims 21 and 22, while prior arts exist that teach find points farthest from a border as well as growing

region from a seed point, none teach or suggest generating a texture sample that is the maximal circumscribed rectangular area grown from a point farthest from the border of a circumscribing region.

- Regarding claim 26, prior art of record does not teach or suggest the use of the specific distance metric.
- Regarding claim 27, and similarly its dependent claim 28, prior art of record does not teach or suggest calculating a weighting factor to be applied to each texture distance using areas from the inquiry image and a data image.
- Regarding claim 32, prior art of record does not teach or suggest excluding texture distance from the calculation of updated mean and deviation using the recited condition.
- Regarding claim 33, prior art of record does not teach or suggest the use of the recited distance metric.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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